



Transforming
Science into
Business

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A close-up photograph showing a hand pouring a golden liquid, likely olive oil, from a clear glass dish into a white ceramic bowl. The bowl contains some pasta. The background is blurred, showing a white tablecloth and other dishes.

Solutions for the food industry



About AZTI.

AZTI has over 30 years' experience and international presence in over 45 countries, boasts a team of over 240 experts, aimed at shaping ideas that, once transformed into products and services, generate business initiatives and recover and preserve natural resources.

It carries out strategic and applied research in an international context, providing comprehensive and innovative solutions for its clients in marine and food innovation. Transforming science into value and wealth for the society of today and tomorrow is the hallmark of AZTI.



Quality assurance

Accreditations and certifications:

AZTI is certified by ISO 9001:2008, ISO 14001:2004, ISO 27001:2007 and UNE 166.002:2006 standards and accredited by ENAC according to the criteria specified in the ISO 17025 standard for the testing of food products defined in the technical annex 167/LE320.

Management Quality Awards:

AZTI was awarded the Gold Q of the Basque Management Quality Award in 2011 and Gold A - Basque Advanced Management Award in 2015.



Solutions for the food industry



01 New foods

/ Integral new food creation service

Market surveillance, technology, legislation, subsidies and grants, patents

Product innovation plans: strategic environment analysis, internal analysis, DAFO to define strategies, definition and analysis and roadmap.

Definition, design, manufacture of food prototype at pilot scale and physical-chemical, microbiology, rheological, sensory and nutritional type definition.

Preparation processes: definition of new processing and optimisation lines of processes in place.

Determination of microbiological and sensory shelf-life and performance of acceptance and preference market tests.

Pilot plant and industrial plant tests: design of tests and analysis, validation of treatments, industrial escalation to plant and drafting of work instructions.

Transfer at industrial level and advice regarding market launching

Proposal of labelling and/or claims of nutritional properties for commercialisation

/ Innovation in high cuisine*: for the food industry and HORECA sector

Technology and global market surveillance.

Tailor-made ingredients: Improvements of nutritional profiles; health claims; new textures and application forms.

Research and application of (new) ingredients: market and consumer adaptation

Viability adapted to the customer needs:

Product development and validation at pilot scale, maintaining organoleptic, nutritional or health qualities.

Study for the preservation of nutritional or health properties.

Life-shelf study for different conservation methods (refrigeration, freezing, sterilisation, etc.)

Sensory analysis as support through the product development

Research with consumers.

* AZTI and Mugaritz are working together from the creativity of chefs to the scientific-technological knowledge of researchers to achieve the final product.



/ New foods with healthy and nutritional characteristics:

Characterisation of new components and ingredients which have an impact on health (obesity, cardiovascular diseases and anti-inflammatory agents) improving their functionality through new technologies.

Design and development of products with healthy and nutritional properties as well as foods easier to consume for sensory-impaired people: products with new textures; flavour enhancement for total or partial salt removal; with sugar reduction and/or removal; gluten-free; fat reduction or replacement; rich in fibre, protein and/or fatty acids.

/ New foods oriented to convenience, sustainability and pleasure:

Develop new products aimed at meeting market demands such as convenience, comfort, quality, ethics and environmental awareness, focusing on the consumer and adapting to consumer needs (well-being, sports, etc.).

Improvement in ingredient properties through technological applications and processes.

Improvement of texture and sensory properties of food (through the optimisation of industrial processes and its impact on food micro structure properties, texture and organoleptic properties)

Innovation of products with better sensory properties, without additives, enriched, products for specific population niches (ethnic groups, senior population, organic, infant, food allergies, etc.)

Product orientation is adapted to industrial production and matters such as sustainability, eco-design and cost reduction (both regarding ingredients and processes) are also taken into account.

02

Sensory analysis

- / **New product development:** setting up product sensory profiles and measurement of degree of acceptance of new products before market launching
- / **Optimisation of formulae and processes:** product reformulation and determination of the impact from formula or preparation technology changes in the product sensory quality. Study on consumers to differentiate changes and into the added value achieved if any.
- / **Sensory quality control:** determination of a product compliance with the sensory quality specifications specified by law, by the customer (e.g. suppliers to large distributors) or internal company requirements.
- / **Shelf-life studies:** study on the real-time evolution of the sensory characteristics of a product under specific conservation conditions (product sensory shelf-life).

- / **Smell-gustatory defects:** determination of the product smell-gustatory profile and research on the existence or appearance of smell-gustatory defects in ingredients, raw materials and the end product.

03

Consumers & Market

- / **Identification and study of trends:** exclusive information on present and future trends to be turned into innovative products and/or services.
- / **Competitive surveillance:** identification and characterisation of market niches and impact trends.
- / **Market research on consumers:** throughout all development phases of new product concepts.

Acceptability, preference and purchase intention: measuring the acceptance, preference and purchase intention degree of products in target consumers.

Home Use Test: Home product delivery and measurement of the degree of acceptance, preference and purchase intention under real consumption conditions.

Benchmarking (Customer vs Competitors)

Research on consumer habits, needs and expectations

Research on context and emotions in product acceptability.

- / **Street surveillance:** Field work (direct market research), identifying and validating street trends at international level (The Food Mirror by AZTI).

04

Production efficiency and savings

- / **Saving and eco-efficient production**

Saving and eco-efficient

productions plans: Preparation of integrated operating plans to achieve savings and increase performance which involve reducing consumption of raw materials and auxiliary materials; packaging; increasing efficiency of use and handling; likewise preventing and reducing loss, waste, discharges and emissions.

Loss and wastage minimisation:

On-going multi-parameter monitoring systems. Combined technologies for wastage recovery.

Smart water management:

Continuous multi-parameter systems
Water reuse systems
3 discharge minimisation barriers
Smart water management and treatment.

Food chain 4.0:

Monitoring, continuous automatic classification according to differentiating criteria with NIR, UV-VIS, Texture-strength, Vision and Microwaves.

Identification of critical quality, efficiency or differentiating parameters and attributes.





Identification, selection and validation of continuous **non destructive sensory solutions**.

Integration of signals and complex data processing.

BIG DATA - Process Analytical Technology (PAT):

Complex data treatment.

Processes and product quality predictive modeling.

Models generation for process automation and systems.

Sensor and control software integration

Improved ergonomics

Ergonomics study of equipment, processes, facilities and jobs which may impact employees' health. Ergonomic risk evaluation. Prevention of Work-Related Musculo-Skeletal Disorders (WRMSD).

Ergonomic optimization:

Ergonomic design and/ or adaptation of equipment, processes, facilities, new technologies and jobs.

Training and practice for employees.

/ Valorisation of food by-products

Preparation of integral operating plans: Systems design and dimensioning of storage, collection, transportation and logistics. Product treatment / processing for its economic recovery. Technical and economic

study of more profitable scenarios for recovery and circular economy in the short and / or long term. Applicable to the whole food industry chain.

Getting feasible bioproducts:

obtaining products of high added value (high value compounds, functional ingredients, etc.) from by-products. Biorefinery design. Getting high value products by bioconversion (microalgae, fungi). preindustrial validation of products and processes of production.

/ Environmental assessment and communication

Eco-design of new food products:

via Life Cycle Analysis (LCA) a product or process can be optimised throughout the entire value chain.

Development of IT tools for economic and environmental evaluation and ecodesign

specific for a sector or company facilitating the implementation of cost-saving measures and providing added-value to the activity from an environmental and economic viewpoint. Tools on the web and desktop linked to the ERP system.

Environmental indicators:

Calculation of environmental carbon footprint, water footprint, etc. environmental certification of products, processes and environmental communication strategies.

05

Food Quality, Safety and Identity

/ Authentication:

Development of methods to

authenticate species or their mixture, food, raw materials (fish, meat, vegetables, fruit, canned food, juice, surimi, etc.), food processes or sustainability standards.

Transfer of molecular techniques,

including personnel training and advice.

Validation of molecular

methodology (among laboratories and development of methodology standards) in traceability systems.

/ Food safety:

Decontamination services to reduce

biological hazards (bacteria, fungi, virus, parasites, etc.) and chemical (pesticides, mycotoxins, allergens). Applicable to liquid and solid product decontamination as well as to thermal and non-thermal processes.

Development of alternative

methods to assess toxicity in new food components and potential food contaminants and mixtures: Zebra fish toxicity study.

Development of kits, sensors and

methodologies to detect biological and chemical contaminants (pesticides, pathogens, allergens) and validating commercial methodologies.



Development of food with reduced biological and chemical risks via new technologies such as:

Food product decontamination using pulsed light.

Reduced allergenicity through processing technologies

Development of **management systems for quality and authenticity automatic control.**

Development and validation of smart systems (labels, sensors, etc.) to assess traceability throughout the food distribution chain.

microbiological and sensory) of fresh, minimally processed, processed, frozen, chilled products (pasteurized or not) and stored at room temperature (sterilised or dehydrated).

/ **Process improvement and validation**

Focus on **improving processes** (wastage reduction, costs, etc.) and end product price to be much more attractive for consumers.

Validation of new technologies in food processes from a quality viewpoint (physical-chemical characteristics, textures, organoleptic), nutritional composition (nutritional and healthy characteristics) and safety.

6

Processing and preservation

/ **Increased product shelf-life:**

Using predictive micro-biology models oriented to products shelf-life

Technologies to improve shelf-life and quality of products: to prevent or reduce alterations (physical-chemical,

/ **Technologies applied to improving sensoriality**

Development of new textures via new technologies such as extension technologies to obtain dehydrated and crunchy food.



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